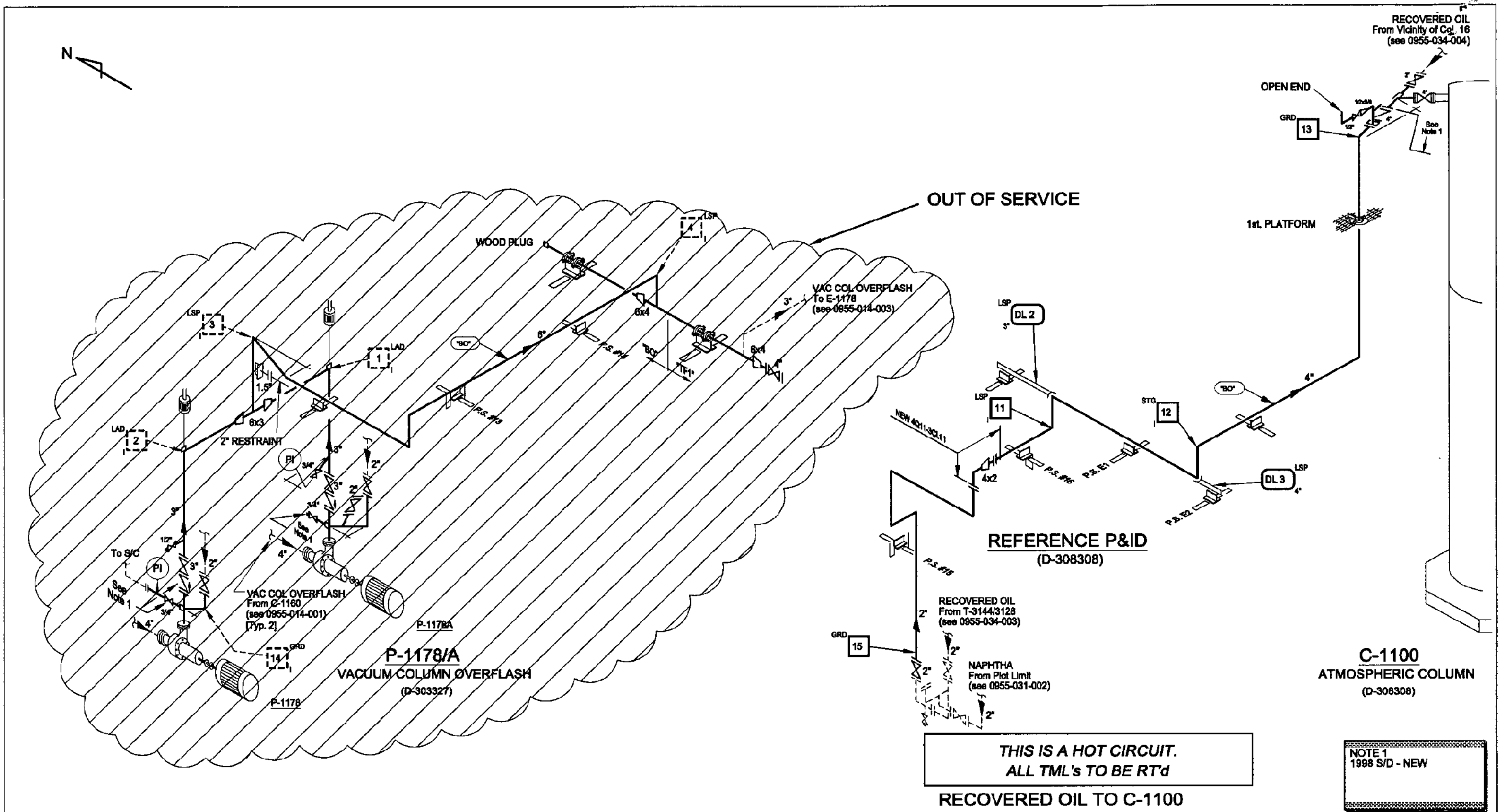
Corrosion Report

Chevron

Equipment Location ID	0955-014-002
Equip. Location Descrip.	C-1160 OUTLET TO C-1100

Remaining Life (Years)	19.52
Retirement Date	11/10/2029
Last Inspection Date	05/05/2010
Next Inspection Date	02/06/2020
Current Corrosion Rate	7.17

DP ID	MEAS METH	DP STAT	DP SZ	DT TYPE	BASE	MEAS 5	MEAS 4	MEAS 3	NEAR	LAST	MIN VALUE	CCR	REM LIFE
011.R	RT	A	4.00	ELL	0.250 11/03					0.250 03/10	0.100	0.00	∞
012.R	RT	A	4.00	ELL	0.280 10/04					0.240 05/10	0.100	7.17	19.52
013.R	RT	A	4.00	ELL	0.220 03/88				0.250 05/01	0.250 05/10	0.100	0.00	∞



RECOVERED OIL TO C-1100

REVISION			
4	4Q2011 D&R S/D "AS BUILT" REMOVED E-1178 PER MOC# 23281. FIELD VERIFIED BY Daniel Kavanagh 02/06/2012	KAVD / TPVA	DNMR / SIPR

STATUS: *ISO570 COMPLETE*	RATING? ☐ 150# ☒ 300#	API-570 ☐ CLASS I	*INSPECTION PIPING ISOMETRIC*
MATERIAL: *5 CR* SERVICE: *VAC OVERFLASH*	STM TRACED? ☒	☒ CLASS II	*#14 NO.9 SIDECUT*
PIPE CLASS: *"TF1"(BO),"3CL11"* PWHT: *YES*	INSULATED? ☒	☐ CLASS III	*#4 CRUDE UNIT (PLANT 11)*
LINE NAME: *RECOVERED OIL TO C-1100*	04/13/2012 TTMW		*DISTILLATION AND REFORMING AREA BUSINESS UNIT*
FROM: *T-3144/3128*	Z	0955-014-002	REV 4 / SHT 1
TO: *C-1100*			

CUSA-CSB-0019503
EPA

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	4/7/2008	**Date Available:**	04/07/2008
History Brief Date:	04/07/2008	**History Brief ID:**	VI-0804196915
Event Type:	Inspection	**In- Service Date:**	04/07/2008
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	09/11/2006
Asset Type:	221	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	RFMS CUI Project Inspection Results		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	PTS
Cause Category:	Information	**Program Status:**	
Effect Category:	Corrosion	**Maintainable Item:**	Pipe Wall
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	CSAA
Save:		**Inspected By:**	CSAA

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

Insulation was removed from the TEE below TML 4 all the way to C-1100. Superficial CUI was noted on all exposed piping. The line was reinsulated from the TEE over to the vicinity of LV-072 for personnel protection. The remainder from LV-072 to C-1100 was left off permanently as per SME decision because this section of the circuit was out of service and blinded. No further action taken. UPDATE 04-07-08: this line was repaired during the last SD and put back into service. It was requested to reinsulate the entire line now that it is in service on 4-07-08.

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	3/6/2007	**Date Available:**	03/06/2007
History Brief Date:	03/06/2007	**History Brief ID:**	VI-0703170256
Event Type:	Information	**In- Service Date:**	03/06/2007
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	03/06/2007
Asset Type:	221	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Replaced leak clamped pipe per (HB-0010048125) 07 S/D.		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	P2S
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Pipe Wall
Repair Location:	Field	**Permanent Repair WO:**	26206207
Temporary Repair:	No	**Name:**	STYR
Save:		**Inspected By:**	STYR

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

Per S/D EWO # BE 139-E1 the leak clamped elbow (See HB-0010048125 12/15/00) was replaced 2007 S/D.

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/6/2005	**Date Available:**	
History Brief Date:	01/11/2005	**History Brief ID:**	EI-0501118215
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	01/06/2005
Asset Type:	221	**Inspection Type:**	EVI
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	5 Year VT/CUI Insp		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron - General
Cause Category:	Compliance, Inspection, PM	**Program Status:**	
Effect Category:	No Effect	**Maintainable Item:**	General
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	JMJG
Save:		**Inspected By:**	

Reliability Comments:

Most of line is out of service; 525 deg F noted at only I/S portion (P-1178 and A discharges to E-1178 feed line). Blinded at LCV- 042.
For CUI insp: RT TML's 7, 8, 11, dead-leg support below TML 10 (no drain hole seen), and dead leg portion of line past E-1178 feed line branch connection.

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	7/17/2001	**Date Available:**	
History Brief Date:	07/17/2001	**History Brief ID:**	HB-0107056108
Event Type:	Inspection	**In- Service Date:**	
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	221	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	P-1178 improper materials.		

Reliability Analysis:

Event Type:	Inspection	**Worked Performed By:**	Chevron Operations
Cause Category:	Design	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Pipe Wall
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	GAKL
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

7/17/01 1:03:32 PM
The inspection department has found an improper line that has been installed from the pump outlet to a sample station and back to the pump inlet. This piping consists of threaded carbon steel pipe and fittings, all disallowed by the pipe class. a recommendation to remove or replace with proper materials has been written and issued.

This line is tied into the two 3/4" valves, one on the inlet and one on the outlet and also feeds the sample station. The 3/4" valve on the outlet side was PMI inspected back in 97'. It was found to be Carbon steel and was replaced during the 1-98' S/D. However the inlet side was either missed or as I believe didn't exist prior to the 98' S/D but rather was installed at that time. I base this on the fact that other items shown and not shown on the existing isometric were found to be improper and were replaced during the S/D. Unfortunately I can't find any evidence in the 98' S/D records of this valve and with the rest of this line being threaded
(disallowed per the pipe class) I have no idea how long it has been in service.

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	10/18/2000	**Date Available:**	
History Brief Date:	10/21/2000	**History Brief ID:**	HB-0010048125
Event Type:	Failure	**In- Service Date:**	
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	221	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	Leak in overflash line to C-1100		

Reliability Analysis:

Event Type:	Failure	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Leak	**Maintainable Item:**	Pipe Wall
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:	Yes	**Name:**	JASA
Save:	No	**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

10/18/2000 10:32:44 AM- A pinhole leak in the 4" overflash line to C-1100 developed in a weld of the pipe to elbow located in the overhead pipeway. This line is the P-1178 discharge through LV-1172 control manifold, (0955-014-002).The line was depressured by rerouting the overflash back to C-1160 (through E-1178). The isolation block valve at C-1100 didn't hold so C-1100 stock returned into the pipe. This lighter material leaked out of the hole rapidly and created a vapor cloud. Nitrogen was introduced to the line to push the C-1100 oil back into the column while the block valve at C-1100 was Kopple sealed tight. With the valve sealed, we still will leave N2 on the 4" line and clamp the leak.
The leaking weld and three other welds in the area were radiographed. The leaking weld was severely internally corroded but the other three welds showed no corrosion. It's thought that the failed weld is not 5Cr, however, records show that it was PMI inspected and it is 5Cr material. Along with leaving the line out of service and leaving a N2 purge on the line, we decided to install a clamp to keep the line together at the weld. We to PMI'd the weld prior to putting the clamp on it. The cover pass is 5Cr, somewhat diluded with the, what is believed to be, carbon steel inner passes. This failure needs to be removed on the shutdown and sent to the Materials Lab for failure analysis.
Naturally the results of the lab analysis will help develop a better inspection program, but we need to identify other corroded welds in this system now. We plan to start to look at some of the welds in this 5Cr system and start to develop what we need to bring this problem to closure.
12/15/00 10:23:20 AM
It was decided during the shutdown to leave the clamped failed elbow in place and not use the overflash line to the

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

atmospheric column. No inspection has been done on this line other than what was done mentioned above. We don't know if there is any more thin welds on this portion or the line. As for the rest of the overflash system, we RT'd what was available on the ground and found nothing. We probably covered 20% of the entire system.

Classification:

Method of Detection: Observation

What Happened when it Failed?

Equipment Unavailable:	Yes - Line taken out of service
Unit Shutdown:	No -
Process Disruption:	No -
Safety Compromised:	No -
Environmental Impact:	No -
Impact Assoc. Processes:	No -
What was the direct cause?	High Temp H2S Corrosion
How did it fail?	Leak
Why did it fail?	Fabrication Error
Why did it fail description:	we THINK the weld is not 5Cr
What is the failure type?	Equipment
What was done to the asset?	Removed From Service
Failure analysis date:	10/21/2000 12:00:00AM
failure Cost ($):	

History Brief Date:	12/15/2000	**History Brief ID:**	HB-0012049547
Event Type:	Failure	**In- Service Date:**	
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	221	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	0955-014-002 Check valve failed at column.		

Reliability Analysis:

Event Type:	Failure	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Valves
Repair Location:	Field	**Permanent Repair WO:**	
Temporary Repair:	No	**Name:**	JASA
Save:		**Inspected By:**	

Findings:

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

PCA ID:
Inspectable:
Sub Item:
Part:
Discussion:

Condition:
Action:
Location:
Damage Mechanism:
PCA Work Order No :

Reliability Comments:

The check valve flapper on the FV-1189 control valve manifold failed and the flapper has lodged up in the valve body. The valve was replaced on the Nov. 2000 shutdown and unfortunately the internals were missing when inspection found the valve body. A new 5Cr valve was installed.
Inspection should internally inspect these valves at the next shutdown to see if the pin and/or flapper are ok. This is one of two 5Cr valves that failed on the run and it's suspicious that both flappers failed. We wonder if the 5Cr valves we're getting in the refinery have the right metallurgy internally.
The other valve is on the overflash piping at the atmospheric column next to the block valve. 0955-014-002

Classification:

Method of Detection: Observation

What Happened when it Failed?

Equipment Unavailable:	Yes - the valve failed, it lost it's flapper
Unit Shutdown:	No -
Process Disruption:	Yes - could not send overflash back to the atmospheric column
Safety Compromised:	Yes - when the line was isolated the check valve allowed atmospheric stock to re-enter the line and leak out of the downstream failed weld
Environmental Impact:	Yes - hot gasses escaped the leak and nearly ignited
Impact Assoc. Processes:	No -
What was the direct cause?	High Temp H2-H2S Corrosion
How did it fail?	Mechanical Damage
Why did it fail?	Improper Material
Why did it fail description:	I'm guessing that the internals material isn't adequate for this service.
What is the failure type?	Equipment
What was done to the asset?	Replace
Failure analysis date:	12/15/2000 12:00:00AM
failure Cost ($):	

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/27/1998	**Date Available:**	
History Brief Date:	07/08/2002	**History Brief ID:**	HB-0207073785
Event Type:	Information	**In- Service Date:**	
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	221	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	PMI		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Pipe Wall
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments:

MATERIAL ANALYSIS ON THE FIVE CHROME PIPING SYSTEM REVEALED C/S VALVES AND VALVE BONNETS AT LOCATIONS 4,42, 52, 219, 127C, 98A-98G, AND 100A-100G COULD NOT BE EXAMINED DUE TO OBSTRUCTIONS.

History Brief

For Location ID: 0955-014-002 in Unit: 0955

Report Date: August 15, 2012 Data Source: Meridium

Brief Data:

Date Not Available:	1/1/1998	**Date Available:**	
History Brief Date:	10/24/2002	**History Brief ID:**	HB-0210080786
Event Type:	Information	**In- Service Date:**	
Equipment ID:	0955-014-002	**Critical:**	L
Asset ID:	0000111052	**Reference Material:**	
Work Order Nbr:		**Incident Event ID:**	
History Type:	FXD	**Inspection Date:**	
Asset Type:	221	**Inspection Type:**	
Cost Center:	K.DCRRI00281		
Unit:	0955 - 4 CRUDE UNIT PLT 11		
Headline:	1998 Shut Down New Valves		

Reliability Analysis:

Event Type:	Information	**Worked Performed By:**	Chevron Maintenance
Cause Category:	Information	**Program Status:**	
Effect Category:	Information	**Maintainable Item:**	Valves
Repair Location:		**Permanent Repair WO:**	
Temporary Repair:		**Name:**	UNK
Save:		**Inspected By:**	

Findings:

PCA ID:	**Condition:**
Inspectable:	**Action:**
Sub Item:	**Location:**
Part:	**Damage Mechanism:**
Discussion:	**PCA Work Order No :**

Reliability Comments: